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KENTUCKY GEOLOGICAL SURVEY



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In all that we do.

Making KYTC Geotechnical Reports Available on the Web

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**Kentucky Geological Survey
University of Kentucky**

in cooperation with the
**Kentucky Transportation Cabinet
The Commonwealth of Kentucky**
and
Federal Highway Administration

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16. Abstract The Geotechnical Branch of the Kentucky Transportation Cabinet (KYTC) prepares technical reports that contain drawings, explanations, and recommendations for road and structure construction projects in Kentucky. These design reports, once complete, also serve as historical reference materials for new projects and are utilized by State contractors, regional transportation offices, as well as the KYTC staff in Frankfort, KY. In order to reduce the support needed to distribute these documents to their constituents, the KYTC required a Web-based system for storing and disseminating the reports. The system developed under this project allows KYTC staff to upload an electronic document from any Web-accessible location and catalog the contents of the reports into a relational database. A map interface was developed to facilitate locating projects with varying kinds of geographic reference on a topographic base. Once entered into the system, reports can be identified and viewed using either a text-based or map-based search tool. The data entry forms were developed as dynamic Web pages using Active Server Pages (ASP) scripting language. The document upload functionality is managed with a third party software product called AspUpload (© Persits Software, Inc.). The data entry program collects metadata about the operator for tracking, and catalogs information about the project's geographic location, purpose, geologic context, and the nature of the included documents. Projects can be located by a number of methods, including county name, route name, road intersection, and milepoint identifiers, 7.5-minute quadrangle name, and place names. Minimum and maximum coordinate extents can be assigned using an interactive Web map, and these rectangular areas are managed in a database to permit viewing on the map. Drill hole coordinate lists can be uploaded, re-projected, and posted on the map as an alternative method of locating the extent of a project. A Web-based search form was developed to allow users to find reports according to geographic and other descriptive characteristics of the projects. Over 4000 reports, approximately 70 percent of the library, are currently accessible from the system.			
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EXECUTIVE SUMMARY

The objectives of this project were to develop a Web-based system to catalog, store, and disseminate electronic versions of Kentucky Transportation Cabinet geotechnical reports. Approximately 6000 historical reports exist in the Geotechnical Branch office, and over 100 new reports are generated every year. A Web distribution system was desired so that Cabinet officials, engineering firms, and the general public would have easy access to the reports. The system will benefit the Cabinet by permitting easy access to documents for comparing previous work to nearby new projects. It also alleviates the need to duplicate the reports for geotechnical firms and public requests for information.

The system has three components: 1) a report upload and data entry application, 2) an interactive Web map for locating and documenting project locations, and 3) a search function for finding reports by their contents and descriptions. Each of the three applications is Web-based, allowing for ease of access and timely software updates. Data entry commenced in January of 2006, and 4300 reports have been cataloged including all structure reports, and many roadway reports. Completion of historical reports is anticipated by Fall of 2006.

This report describes the software functions for each of the three applications.

INTRODUCTION

The Geotechnical Branch of the Kentucky Transportation Cabinet employs engineers and geologists to conduct evaluations of site conditions for highway construction projects, associated structures, as well as remediation work resulting from landslides and rock falls. The final product of these investigations is a report containing a narrative of the work performed, design recommendations, maps, drawings, and summaries of collected data. Since 1964, an estimated 5,000 to 6,000 reports have been generated and many of these are kept on file at the branch office as reference materials for new projects. Unfortunately, these hard-copy reports are not easily accessible, especially to those outside the office, and it is not possible to identify specific reports that pertain to some geographic area or address certain kinds of engineering issues. Most recent reports are prepared electronically, and it is not difficult to convert older reports to digital format. Consequently, a Web-based system of searching and retrieving the electronic versions of the reports was desired.

OBJECTIVES AND SCOPE OF STUDY

The objective of this project was to create a software and database system that facilitated cataloging of geotechnical reports, and making them available to users on the Web. The phases of the project included a needs assessment, database design, development and testing of a data entry interface, development of support functions for locating and describing project areas, and development and testing of a user search function.

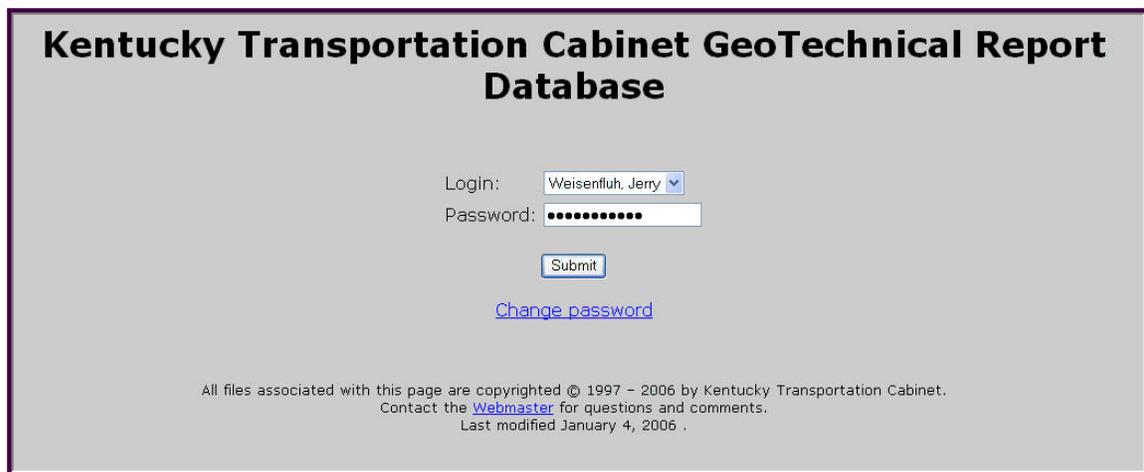
BACKGROUND

The Kentucky Geological Survey at the University of Kentucky had already developed an online catalog of geologic publications and maps for serving its own reports to the public. This system includes a database application, dynamic Web pages for searching and downloading publications, and the necessary computer hardware for public Web services. For the sake of time and efficiency, it was decided to extend that system to include the specific characteristics of geotechnical reports. The use of Web-based programs provided several advantages for development: 1) ease of accessibility to tools under development, 2) quicker update distribution, 3) greater portability, and 4) compatibility with existing KGS web applications.

DATA ENTRY APPLICATION

User Login

Access to the data entry application is controlled by two levels of password-protected user accounts. Normal users can add new reports, edit “unverified” reports, create map extents, and manage their own password. Administrative users have additional privileges for adding users, editing locked (verified) files, adding addendums to existing reports, and deleting reports. User names are selected from the pull down menu shown on Figure 1. The function to change password is found on the same page. User’s can access the application from any location with internet access. User names and time stamps are tracked at the record level for both the initial data entry and the most recent edit activity for a report.



Kentucky Transportation Cabinet GeoTechnical Report Database

Login: Weisenluh, Jerry
Password: ●●●●●●●●

Submit

[Change password](#)

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Contact the [Webmaster](#) for questions and comments.
Last modified January 4, 2006 .

Figure 1. Login menu for user access and account management.

Electronic Report File Upload

The first step in the data entry process is to upload the electronic version of the report to the server using the function on Figure 2. The file format for this database was designated as Adobe PDF, however other document formats are permissible. The AspUpload program (© Persits Software, Inc.) manages the file transfer process and harvests some information from the file, such as size in megabytes.

Kentucky Transportation Cabinet Geotechnical Report Database

Main Menu

Upload a New KYTC Report File or replace an existing file

Step 1: Use the browse button to select a Report file on your local computer(valid file format: S-002-2005.pdf)

Step 2: Click the upload button to transfer file and initiate data entry/edit.

Search/Edit Existing KYTC Report

Search Report Number: County:

Limit Search to unverified reports only

Wildcard Meaning:
 % Matches any string of zero or more characters.
 - Matches any one character.

Back to [Login Page](#)

Figure 2. File upload function found on Main Menu form.

Reports are placed in a temporary location until filenames are verified and data entry is complete, at which time the file is moved to its permanent location on the server. File name validation is performed at two levels—during upload and after data entry.

The format for the filename is X-001-2005.pdf, where X is a letter indicating the project type (S = structure, R = roadway, P = planning, and L = landslide), 001 is the report sequence number within a year (with leading zero's), and 2005 is the four-digit year in which the report was completed. If the filename is valid (e.g., contains all three pieces of information), but not formatted correctly, the program reformats it. For example, the filename prefix S-7-95 would be recognized as a valid file and renamed to S-007-1995. If the filename is not valid, data entry may proceed and the correct filename is determined from information that the user enters. Once the filename is found to be valid and properly formatted, the database is checked to determine whether a report of the same name already exists. If so, it is assumed that the selected file is an addendum (copy of original report with added pages) that the user wishes to supersede the original. The user is alerted of this condition and given the option to edit the report information or exiting. Appendix I illustrates the logic of the upload process.

Project Location and Report Characteristics

Figure 3 shows the basic identifying information for a report, including a variety of methods for locating the project. Data normalization is controlled by several methods. The entry boxes with blue arrows provide a selection list to limit choices to valid entries only. This prevents users from entering misspelled words or invalid responses. Required fields, shown by an asterisk, generate an error message if the user attempts to submit the record without making a selection or entering data. Other data entry fields are evaluated for data type and character length. Some numeric fields are saved as strings with leading zeros, and this formatting is performed by the application. Finally, the fields in the upper right corner are calculated by the program to insure proper formatting. Help messages for each entry field are provided when the user holds the mouse over the field name.

KYTC Geotechnical Report Entry Form

Uploaded KYTC Report File is: S-999-2005.pdf
PublicationId: 11317

Company Name*	Fuller, Mossberger, Scott, & May ▾	Calculated Fields(Do NOT EDIT) <u>District Number</u> 03 <u>Item Number</u> 03-1250.00 <u>Report Name</u> S-999-2005 <u>Report Type</u> Structure <u>Route Label</u> I-65 <u>Bridge Identifier</u>
County Name*	Barren ▾	
Item Prefix	03 ▾	
Item	1250 . 00	
Project Type*	State Bridge ▾	
Project Phase*	Design ▾	
Mars Number	35899 - 01D	
Report Number*	999	
Report Year*	20 ▾ 05	
Route Prefix*	Interstate (I) ▾	
Route Number*	65	Structure Over Barren River
Route Suffix	▾ Or ▾	Bridge Prefix B ▾
Route SectionID	▾	Bridge Number ▾
Pages	6	Bridge Suffix ▾
Brief Description	3-span bridge over Barren River	
Parent Report	▾	

Figure 3. Upper part of data entry form for recording report characteristics.

Report Contents

During the design phase of the project, Geotechnical Branch staff developed lists of the kinds of documents typically included in reports as well as most of the engineering issues that may be discussed in any report. These items can be identified for a given report using the check boxes in Figure 4. During the early data entry phase, users entered items not found on the form in the “other contents” field, and those that were frequently occurring were eventually added to the standard list.

Report Contents	
Cut Slope Designs	
Rock Fall Fence	<input type="checkbox"/>
Wire Mesh	<input type="checkbox"/>
Back Stowing	<input type="checkbox"/>
Shape Ditches	<input type="checkbox"/>
Soil Modification	
Dynamic Compaction	<input type="checkbox"/>
Wick Drains	<input type="checkbox"/>
Surcharging	<input type="checkbox"/>
Special Structures	
Gabian Baskets	<input type="checkbox"/>
RSS Slopes	<input type="checkbox"/>
Tunnels	<input type="checkbox"/>
Tied Back Walls	<input type="checkbox"/>
Soil Nail Walls	<input type="checkbox"/>
Cantilever Wall	<input type="checkbox"/>
Cantilever H-Pile Wall	<input type="checkbox"/>
Cantilever Railroad Steel Wall	<input type="checkbox"/>
MSE Wall	<input type="checkbox"/>
Drilled Shafts	<input type="checkbox"/>
Settlement Platform	<input type="checkbox"/>
Rock Bolts	<input type="checkbox"/>
Friction Piles	<input type="checkbox"/>
End Bearing Piles	<input type="checkbox"/>
Black shale remediation	<input type="checkbox"/>
Mining	<input type="checkbox"/>
Geophysics	<input type="checkbox"/>
Instrumentation	<input type="checkbox"/>
Seismic design	<input type="checkbox"/>
Litigations	<input type="checkbox"/>
Lightweight fill applications	<input type="checkbox"/>
Shotcrete	<input type="checkbox"/>
Excess Materials Sites	<input type="checkbox"/>
Chemical Stabilization	<input type="checkbox"/>
Sinkholes	<input type="checkbox"/>
Sheet Types	
Project Layout	<input type="checkbox"/>
Location Map	<input type="checkbox"/>
Subsurface Data Sheet	<input type="checkbox"/>
Soil Profile	<input type="checkbox"/>
Geotechnical Notes	<input type="checkbox"/>
Cut Stability	<input type="checkbox"/>
Embankment Stability	<input type="checkbox"/>
Loading Diagrams	<input type="checkbox"/>
Coordinate Data Sheet	<input type="checkbox"/>
Other Content Items:	<input type="text"/> (Separate by ;)

Figure 4. Check boxes for report contents.

Two additional attributes can be set for a report using the controls on Figure 5. The first identifies the geologic setting for the report by choosing one or more geologic unit names. A search function is provided to look up valid names, and the resulting list has an “Add” function that transfers the selection to the entry box at left. Multiple selections are appended to the string with a semi-colon separator. The second control establishes a rectangular coordinate extent (Maparea) for the project. While it is desirable to define this extent as accurately as possible, in cases where the exact location

cannot be determined, users can associate the project with a place name or 7.5-minute quadrangle. If neither of these are selected, the extent defaults to that of the county specified for the project.

The screenshot shows a web form with several sections. On the left, there is a section titled "Enter stratigraphic Codes" with a text input field containing "Ste. Genevieve Limestone" and a note: "(If it has more than one code, please use ; to separate them.)". To the right of this is a box titled "IF you do not know FMCodes, You can Search Codes:" containing a text input field with "Ste. Gen.", a dropdown menu with "Quaternary" selected, and two buttons: "Search Unit Name" and "Search by Age". Below these is a section titled "You can Assign Map Extent from one of the following methods:" with three options: "City" with a dropdown menu showing "Glasgow", "OR", "Quad" with a dropdown menu showing "Austin", "OR", and "Custom Maparea". To the right of this section is a "MapArea ID:" label and a text input field containing "KYTC3455".

Figure 5. Geologic context and project map extent.

In order to define custom map areas, it was necessary to design an interactive Web map with a variety of functions for finding geographic places and delineating a project area.

INTERACTIVE MAP FUNCTIONS

An ESRI ArcIMS map service was created and customized for KYTC use in order to facilitate locating project areas on a topographic base map or digital aerial photograph. Most geotechnical reports reference project locations relative to a county and route name, while providing varying amounts of additional references, such as milepoints, stream crossings, quadrangle names, and place names. Search functions are provided to locate specific features of these kinds. Once the area of interest is identified, a number of tools are provided to measure and record the coordinate extent of the area.

Identify an area of interest

Users open the KYTC Basemap service in an internet browser using a password-protected internet address.

Select the Area Search tab on the upper right hand side of the page (Figure 6). The default search type is county name.

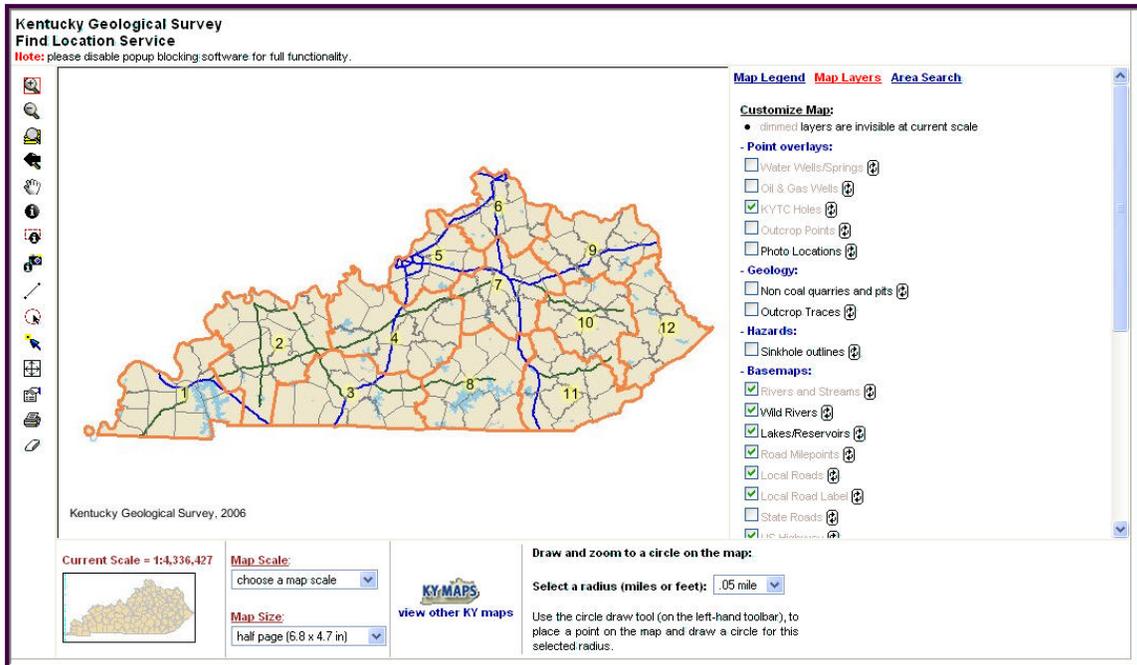


Figure 6. Statewide view of KYTC basemap service

Expand the pull-down menu for Geographic Area Type (Figure 7) and select a search method that is most appropriate for your project area. Many of these searches only require selection of a single value. More complex searches will have instructions on the form. For example, Figure 8 shows the methods used for identifying a specific road intersection. Once the search criteria are specified, click the Search or Zoom button at the bottom of the search form. The map will refresh, zoomed to the extent of the feature you selected.

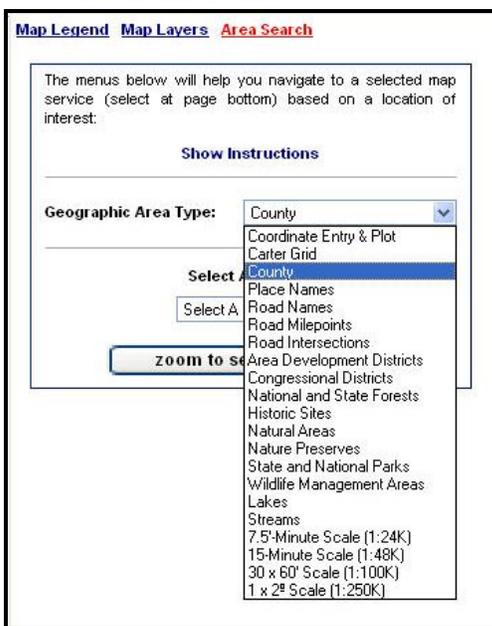


Figure 7. Geographic area search type selection

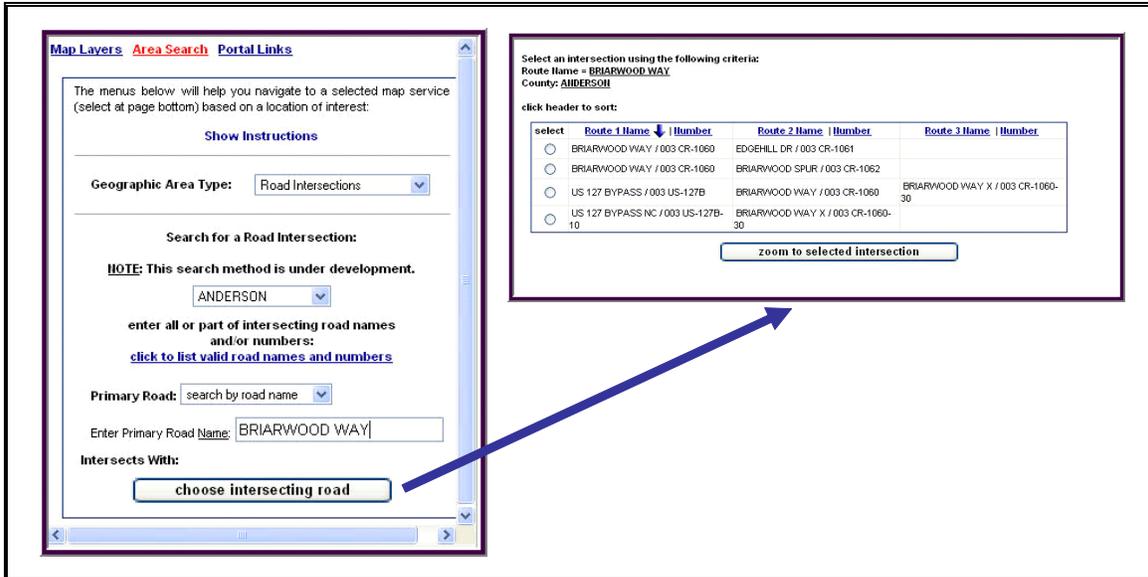


Figure 8. Dialogs for searching road intersections

Steps for using the road intersection search method:

- Select the county name for the area of interest
- Click the blue link to get a list of valid road names or numbers
- Copy and paste the primary road name or number from the list and set the format (name or number) accordingly
- Click “Choose intersecting road”
- Check the radio button for the road intersection of interest
- Click “Zoom to selected intersection”
- Use the zoom in  or zoom out  tool to adjust the map to encompass the extent of the project area.

Create and save map extents

The KGS map extent database records the minimum and maximum rectangular coordinate bounds for standard and custom geographic areas or features. These data are utilized for searching a variety of databases that have assigned map extent values. For example, a published map that is assigned a map extent code for a 7.5-minute quadrangle can be identified with a database query that specifies any coordinate range that overlaps that of the quadrangle. Most standard area types for Kentucky are included in this database (e.g., those shown on Figure 7). Because KYTC projects do not coincide with regular geographic areas, a map-based tool was needed to define a custom area and store it in the database. That tool is illustrated on Figure 9. Users select the mapextent tool , then drag a rectangle from the upper left to the lower right of the project area. On the subsequent dialog (Figure 10), users specify the extent type as a KYTC project area, assign the report number, then submit the entry to the database.

Project extents are drawn dynamically on the base map as green rectangles using the information entered in the database (lower part of Figure 9), and are labeled with the project report name. At scales smaller than 1:1,000,000, the project areas are drawn as a green star.

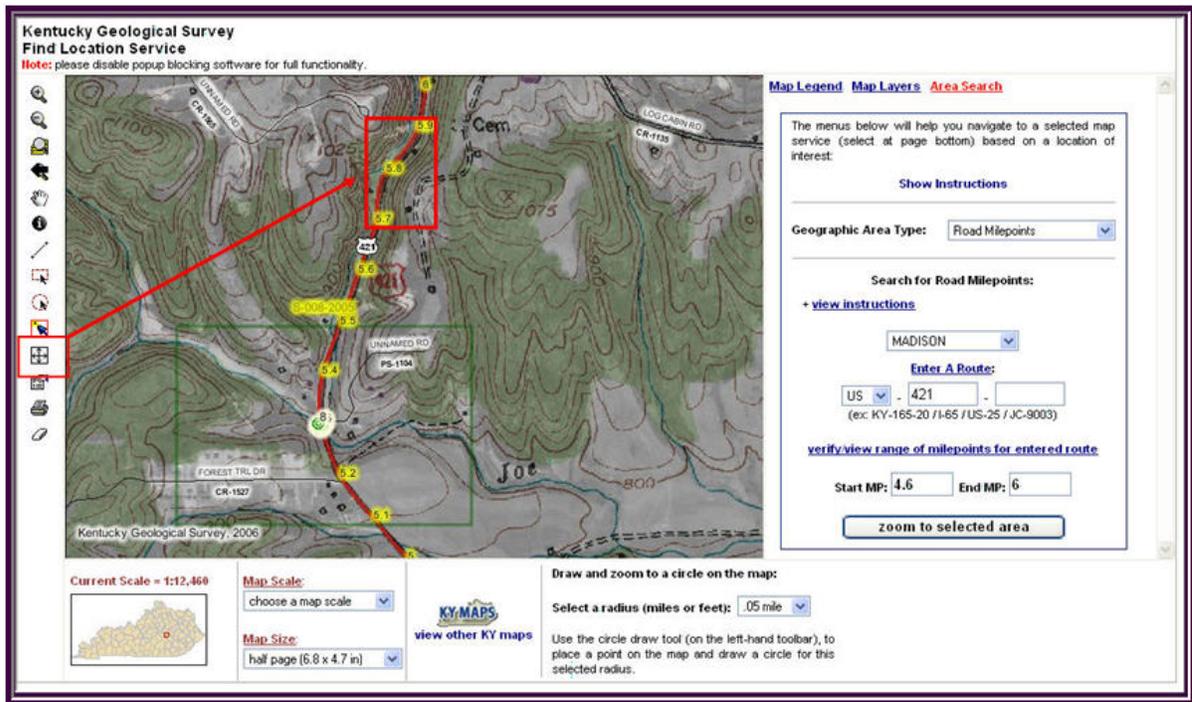


Figure 9. Adding a new map extent between two milepoints.

Kentucky Geological Survey
Define a Map Area:

Coordinates of Box Selected:
 Minimum Latitude = 37.682424
 Maximum Latitude = 37.763232
 Minimum Longitude = -85.196328
 Maximum Longitude = -85.104745

Select An AreaType:

Modify the coordinates of an existing extent (for the areatype selected)
**the coordinates of an existing extent can be updated with the coordinates of the selected box

Enter the report number (e.g. S-026-2005):

SUBMIT THIS INFORMATION (ONLY CLICK ONCE!)

Figure 10. Add new map extent dialog.

Edit existing map extents

Modifying an existing map extent is similar to adding a new one. The user drags a new rectangle on the map; then on the entry form (Figure 10) checks the “Modify” box. A list of existing map extents within the users map view is provided for selection or the

user can enter the name of a report that is outside the view area. Once the existing extent is selected, its values are updated with the new coordinates.

Upload and view hole locations

For most recent projects, surveyed hole locations are available that can be used to define the extent of a project. This basemap function  uploads a coordinate list (Figure 11) to the service, and converts the coordinates, if necessary, using the form on Figure 12. The input coordinate projection and datum are specified by clicking the appropriate radio buttons. The form supplies instructions for formatting a valid coordinate file.

A	B	C	D	E	F	G	H
ID	LAT83	LON83	Label	Station	Offset	Elevation	Comment
1	36.931175	86.492685	1	98+92.00	-39	582.2	
2	36.931019	86.492748	2	98+46.52	CL	579.1	On center line
3	36.930862	86.492811	3	98+01.07	39	579.8	
4	36.931263	86.492545	4	99+43.69	-45	581.6	
5	36.931111	86.492607	5	98+99.35	-7	577.7	
6	36.930952	86.492667	6	98+54.23	33	578.3	
7	36.931402	86.492223	7	100+50.38	-39	577.5	
8	36.931246	86.492285	8	100+05.32	CL	578	On center line
9	36.93109	86.492347	9	99+60.20	39	578.4	
10	36.931517	86.491989	10	101+30.46	-39	581.2	
11	36.93136	86.492052	11	100+85.00	CL	582.3	On center line
12	36.931204	86.492115	12	100+39.54	39	583.5	

Figure 11. Hole coordinate upload format.

Selecting “View points” plots the holes on the map so that the user can verify that the locations are correctly entered. Once the coordinate list is validated and plotted, the user can draw a map extent that bounds the holes (Figure 13). Selecting “Convert Coordinates and Download” allows the user to specify an output projection and datum, and these coordinates are appended to the original file and returned to the user.

The coordinate map plots are ephemeral by default, but users can store hole locations permanently so that they will always show on the map. On the upload page (Figure 12), click the “Validate Coordinates” button. This function converts the coordinates from the specified projection and datum and reports an error if the conversion is out of bounds (outside Kentucky). On the “validate” pop-up dialog, there is a button for uploading the holes to the database.

Kentucky Geological Survey
 Kentucky multiple coordinates conversion tool

Upload A Text File For Viewing Points and/or Conversion:

Does file contain a header row? YES NO

Text File Must Follow These Format Rules:

- must be smaller than 1 MB
- must indicate (above) if file contains a header row
- header row column names **cannot** contain spaces
- header row column names must be **UNIQUE**
- must be comma-delimited
- must contain at least 4 columns:
 - 1st column = id number (must be a number)
 - 2nd column = latitude/northing/y (must be a number)
 - 3rd column = longitude/easting/x (must be a number)
 - 4th column = label field (text - can be id number and must be less than 12 characters)

If uploading this file to the database, the file must have these 4 additional columns (in this order):

- 5th column = station (text)
- 6th column = offset (text)
- 7th column = elevation (must be a number - will set to -9999 if no entry)
- 8th column = comments (memo text)
 - **this field MUST be enclosed by double quote marks (") IF it contains commas**
 - **all fields can be enclosed by double quote marks**
 - **avoid using double quotes within this and any fields - to avoid data truncation**
- if not uploading: can have as many columns as necessary after the first four columns

Select the Datum and Projection of the Coordinates in Your Data File:

SELECT A DATUM	SELECT A PROJECTION
North American Datum 1927 (NAD-27) <input type="radio"/>	Latitude/Longitude (decimal degree) <input checked="" type="radio"/>
	UTM Zone 17 (meters) <input type="radio"/>
	UTM Zone 16 (meters) <input type="radio"/>
	KY State Plane Single Zone (US Feet) <input type="radio"/>
North American Datum 1983 (NAD-83) <input checked="" type="radio"/>	KY State Plane South Zone (US Feet) <input type="radio"/>
	KY State Plane North Zone (US Feet) <input type="radio"/>

note: KY State Plane Single Zone is **NOT** available for NAD 27 Datum

Click on buttons below to upload text file and do the following:

Figure 12. Dialog for uploading and converting a hole coordinate list.



Figure 13. Creating a map extent from plotted hole locations.

Identify project information

The internet base map can also be used to view report summaries, access the online version of reports, and list hole location information. With the “KYTC holes” and “KYTC mapareas” layers checked, users can query the map using the point identify tool  or the area identify tool . The results form is illustrated on Figure 14.

The upper table lists any hole locations that are within the area search or proximal to the point identify location. Clicking the zoom link for a specific hole will focus the map with that hole at the center.

The lower table lists any project reports that are within the area search or proximal to the point identify location. Clicking the summary link (e.g., link (64)) produces a new window with summary information about the report. From the summary page there is another link that will open the online report in a new Internet Explorer window. Users must have the free Adobe pdf viewer plugin installed on their computer. Clicking the MapArea link will refocus the map to the extent of the selected project.

text search:

Kentucky Geological Survey
Find Location Service
Identification of Features

- [Print This Page](#)

KYTC Holes Information:

Hole ID	Hole Number	Report Name	Label	Station	Offset	Elevation	Map Zoom
14	1	S-075-2005	1	78+32	45.5LT	748.3	zoom
31	2	S-075-2005	2	79+23	49.5LT	758.6	zoom
47	3	S-075-2005	3	80+30	43.0LT	766	zoom
63	4	S-075-2005	4	81+05	45.1LT	769.9	zoom
76	5	S-076-2005	5	156+39	91.0LT	717.1	zoom
88	6	S-076-2005	6	156+17	91.0LT	718.4	zoom
98	7	S-076-2005	7	156+17	67.0LT	717.2	zoom
106	8	S-076-2005	8	155+91	44.0LT	717.5	zoom
113	9	S-076-2005	9	155+39	91.0RT	717.6	zoom
120	10	S-076-2005	10	155+14	91.0RT	718.8	zoom
151	19	S-078-2005	19	204+40	12.0LT	792.5	zoom
153	20	S-078-2005	20	204+99	17.0LT	794.5	zoom
154	21	S-078-2005	A	202+99	8.0LT	803.4	zoom
155	22	S-078-2005	B	203+48	28.0LT	804.5	zoom

KYTC Project Areas Information:
 **click the Map Area to zoom to that area

Report	Route	Map Area	Project Type	Structure Over	Description	Summary
S-077-2005	US-421	KYTC017	Wall		Retaining wall left of center line mainline station 116+25.8 to 118+80.0	link (64)
S-075-2005	KY-676	KYTC153	State Bridge	L&N Railroad	Franklin Co. - US 421/KY 676 over L&N Railroad	link (207)
S-076-2005	US-421	KYTC154	Culvert		Franklin Co. - 8' X 10' Culvert @ Mainline Sta. 155+79.62 - Structure Report	link (208)
S-078-2005	US-421	KYTC160	Wall		Franklin Co. - Retaining Wall @ Ramp B Sta. 202+86.7 to 204+91.2 - Structure Report	link (215)
S-061-1976	US-60	KYTC2006	State Bridge	KY 676 (South Frankfort Bypass)	Bridge on US 60 over KY 676 at MP 12.020 (US 60/US 421/KY 676 Interchange)	link (2074)
S-075-1977	KY-676	KYTC3176	Wall	KY 676 & US 421	Retaining Walls at Urban Interchange of East-West Connector (KY 676), US 60, & US 421	link (3352)

Figure 14. Results page generated from area identify function.

View other internet maps

The KYTC base map service can link to a variety of other internet maps and databases using the  tool. This feature opens a list of Kentucky internet services (Figure 15) that are categorized by the content of the sites. Linked maps open in a new browser window zoomed to the same map area as that of the base map. Database searches (KGS-tabular) return records with locations within the view extent. An example of the link to the KY Geologic Map Information Service is shown on Figure 16.

<p>Use the links below to open a map or data service to the map extent above:</p> <ul style="list-style-type: none"> Data searches yield tabular results, and on large areas may yield slow response times (and timeout errors) Descriptions of the services below 		
<p>Basemaps:</p> <ul style="list-style-type: none"> Kentucky Basemap Kentucky Simple Basemap National Map Viewer (USGS) Kentucky's Incorporated Cities (DGI) 	<p>Geology:</p> <ul style="list-style-type: none"> KGS Publications (tabular) KY Geologic Map Information Service (KGS) Core & Sample Holdings Map (KGS) 	<p>Energy:</p> <ul style="list-style-type: none"> non-mining energy related information Coal Information Map (KGS) Coal Borehole Data (KGS-tabular) Coal Quality Data (KGS-tabular) Coal Thickness Data (KGS-tabular) Oil & Gas Wells Map (KGS) Oil & Gas Well Data (KGS-tabular)
<p>Mining:</p> <ul style="list-style-type: none"> Active Coal Mines (KMMI) All Historical Coal Mines (KMMI) Surface Mining Information (KDHR-DSMRE) 	<p>Water:</p> <ul style="list-style-type: none"> Water Wells and Springs Map (KGS) KY Groundwater Data Repository Map and Data (KGS) Water Well Data (KGS-tabular) Springs Data (KGS-tabular) Hydrology of Kentucky (USGS) KY e-Clearinghouse Mapping Portal -- (reg. req.) (WRIS) KY Proposed Water Infrastructure Projects (WRIS) Kentucky's Water Infrastructure -- (reg. req.) (WRIS) Water Management Planning (WRIS) Wastewater Mapping Portal (WRIS) Watershed Viewer (KDHR) Surface Mine Water Monitoring Data (KDHR-DSMRE) 	<p>Transportation:</p> <ul style="list-style-type: none"> Active Six Year Plan Projects (KYTC) HIS Interactive Planning Map (KYTC) Geotechnical reports (tabular - KYTC)
<p>Land-Use Planning:</p> <ul style="list-style-type: none"> services that are specifically directed towards land-use planning Land-Use Planning (KGS) 	<p>Counties:</p> <ul style="list-style-type: none"> services that serve Kentucky counties (data may be limited to the specific county only) Barren County, Kentucky PVA (DGI) Boone County GIS (BCPC) Crittenden County, Kentucky PVA (KDHR) Lexington-Fayette County Basemap (LFUCG) Lexington-Fayette County Zoning (LFUCG) Pendleton County, Kentucky PVA (DGI) Wayne County, Kentucky PVA (DGI) Webster County, Kentucky PVA (DGI) 	<p>Recreation:</p> <ul style="list-style-type: none"> Hunting and Fishing Sites (KYFWIS) Kentucky's State Parks (KYPARKS) KY GAP Public Lands (KYFWIS)

Figure 15. KGSMAPS links to map and database web sites.

Kentucky Geological Survey
Kentucky Geologic Map Information Service
Note: please disable popup blocking software for full functionality.
[KGS Home](#) > [Maps, Pubs. & Data](#) > [Geologic Map Service](#)

Map Legend [Map Layers](#) [Geologic Information](#)

Geologic Units In Current View:
- hide geologic units
1:24,000 scale data (detailed geology)

- Qal Alluvium (Quaternary - Quaternary)
- QTf High-level fluvial deposits (Tertiary - Quaternary)
- Oct Clays Ferry Formation (Middle Ordovician - Upper Ordovician)
- Olu Upper part of Lexington Limestone (Lower Ordovician - Middle Ordovician)
- Ot4 Tanglewood Limestone Member (4) (Lower Ordovician - Middle Ordovician)
- Ot3 Tanglewood Limestone Member (3) (Lower Ordovician - Middle Ordovician)
- Ot2 Tanglewood Limestone Member (2) (Lower Ordovician - Middle Ordovician)
- Otb Brannon Member (Lower Ordovician - Middle Ordovician)
- Ot1 Tanglewood Limestone Member (1) (Lower Ordovician - Middle Ordovician)
- Olr Lower part of Lexington Limestone (Lower Ordovician - Middle Ordovician)
- Ot Tyrone Limestone (Lower Ordovician - Middle Ordovician)

Scale = 1:5,673
Map Scale: choose a map scale
Map Size: half page (6.8 x 4.7 in)

[General information about this service](#)

Figure 16. KGSMAPS link to geologic map service.

SEARCHING GEOTECHNICAL REPORTS BY CONTENTS

Whereas the interactive base map can search for reports by location, users also need to find reports according to their contents and the description of the project. A Web page was developed to provide a variety of search options, and can be found at <http://kgsweb.uky.edu/KYTC/search.asp>.

Search by project location

The search items at the top of the form pertain primarily to geographic location (Figure 17). Users can specify any combination of selections. All selected items must be “true” in order to find the report. *District* refers to Transportation District numbers. *Item Number* can be searched by entering the beginning part of the number. For example, entering 5 would find all item number in the 5000 series. Entering 05 would find numbers in the 500 series. All other options provide pull down menus for valid selections.

District	All ▾	Quadrangle	All ▾
ItemNumber	Begins with <input type="text"/>	RoutePrefix	<input type="text"/> ▾
County	All ▾	RouteNumber	<input type="text"/>
ProjectType	All ▾	RouteSuffix	<input type="text"/> ▾ Or <input type="text"/>

Figure 17. Geographic search criteria

Search project description

Users can search for reports prepared by a specific company or agency, and for any specific period of time. Reports that have been assigned a Mars number can be searched by entering the 5-digit prefix of that number. Bridge reports can be searched by their number. Because bridge numbers are assigned at the county level, specifying the county name is required. Reports can also be searched by their report names using wildcard searches. Entering “R-001” will find the first roadway report in any year. Entering “S*1999” will find all structure reports in 1999. Entering “L*199-“ will find all landslide reports in the 1990’s. To find reports associated with particular geologic units, use the function in the lower right corner of Figure 18 to search for valid unit names. For example, typing “Lex” will return one record for “Lexington Limestone”. Click the “Add” button to select this item for the search criteria. Only one geologic unit can be searched at a time. The description field contains a brief description of the project and its location. Entering “3 –span”, for example, would return all reports concerning 3-span bridges.

CompanyName	All Company	MarsPrefix	
YearRange	<input type="radio"/> Before <input type="radio"/> After <input type="radio"/> Between	ReportName	<input type="text"/> <small>Wildcard Meaning: % Matches any string of zero or more characters. - Matches any one character.</small>
Bridge Type	All	Description	<input type="text"/>
BridgeNumber	<input type="text"/>		
Geologic Unit	<input type="text"/>	Enter part of unit name, click search for matches, then click add to select desired geologic unit. <input type="text"/> <input type="button" value="Search Unit Name"/> <input type="text" value="Quaternary"/> <input type="button" value="Search by Age"/>	

Figure 18. Project characteristic search items.

Search report contents

Users can check any items of interest. Unlike the other search options which require all selections to be “true”, contents searches will find all reports that contain any of the checked items.

Cut Slope Designs		Friction Piles	<input type="checkbox"/>
Rock Fall Fence	<input type="checkbox"/>	End Bearing Piles	<input type="checkbox"/>
Wire Mesh	<input type="checkbox"/>	Black shale remediation	<input type="checkbox"/>
Back Stowing	<input type="checkbox"/>	Mining	<input type="checkbox"/>
Shape Ditches	<input type="checkbox"/>	Geophysics	<input type="checkbox"/>
Soil Modification		Instrumentation	<input type="checkbox"/>
Dynamic Compaction	<input type="checkbox"/>	Seismic design	<input type="checkbox"/>
Wick Drains	<input type="checkbox"/>	Litigations	<input type="checkbox"/>
Surcharging	<input type="checkbox"/>	Lightweight fill applications	<input type="checkbox"/>
Special Structures		Shotcrete	<input type="checkbox"/>
Gabian Baskets	<input type="checkbox"/>	Excess Materials Sites	<input type="checkbox"/>
RSS Slopes	<input type="checkbox"/>	Chemical Stabilization	<input type="checkbox"/>
Tunnels	<input type="checkbox"/>	Sinkholes	<input type="checkbox"/>
Tied Back Walls	<input type="checkbox"/>	Sheet Types	
Soil Nail Walls	<input type="checkbox"/>	Project Layout	<input type="checkbox"/>
Cantilever Wall	<input type="checkbox"/>	Location Map	<input type="checkbox"/>
Cantilever H-Pile Wall	<input type="checkbox"/>	Subsurface Data Sheet	<input type="checkbox"/>
Cantilever Railroad Steel Wall	<input type="checkbox"/>	Soil Profile	<input type="checkbox"/>
MSE Wall	<input type="checkbox"/>	Geotechnical Notes	<input type="checkbox"/>
Drilled Shafts	<input type="checkbox"/>	Cut Stability	<input type="checkbox"/>
Settlement Platform	<input type="checkbox"/>	Embankment Stability	<input type="checkbox"/>
Rock Bolts	<input type="checkbox"/>	Loading Diagrams	<input type="checkbox"/>
		Coordinate Data Sheet	<input type="checkbox"/>

Figure 19. Report contents search selections.

Once all search options have been specified, click the “Submit” button at the bottom of the page. Results of the search will appear in a pop-up window like the one in Figure 20. There are four additional links on this results page: 1) the online pdf report, 2) the report summary page, 3) the base map zoomed to the extent of the project, and 4) the geologic

map zoomed to the extent of the project. Click “Back to Search Page” to conduct another search.

Kentucky Transportation Cabinet Geotechnical Report Database

Search Result

Sort Result by and then by

County	Report Name	Link to Report File	Item Number	Summary	Year	
Crittenden	S-008-1993	S-008-1993.pdf	01-1031.00	summary	1993	View Geologic Map View Basemap
Crittenden	S-051-1987	S-051-1987.pdf	01-0101.00	summary	1987	View Geologic Map View Basemap
Crittenden	S-053-1987	S-053-1987.pdf	01-0109.00	summary	1987	View Geologic Map View Basemap
Crittenden	S-059-1987	S-059-1987.pdf	01-0103.00	summary	1987	View Geologic Map View Basemap
Crittenden	S-033-1983	S-033-1983.pdf	01-0617.00	summary	1983	View Geologic Map View Basemap
Crittenden	S-082-1983	S-082-1983.pdf	01-0140.00	summary	1983	View Geologic Map View Basemap
Crittenden	S-079-1982	S-079-1982.pdf	01-0139.00	summary	1982	View Geologic Map View Basemap
Crittenden	S-060-1977	S-060-1977.pdf	01-0000.00	summary	1977	View Geologic Map View Basemap
Crittenden	S-033-1976	S-033-1976.pdf	01-0243.00	summary	1976	View Geologic Map View Basemap

Total: 9 records found

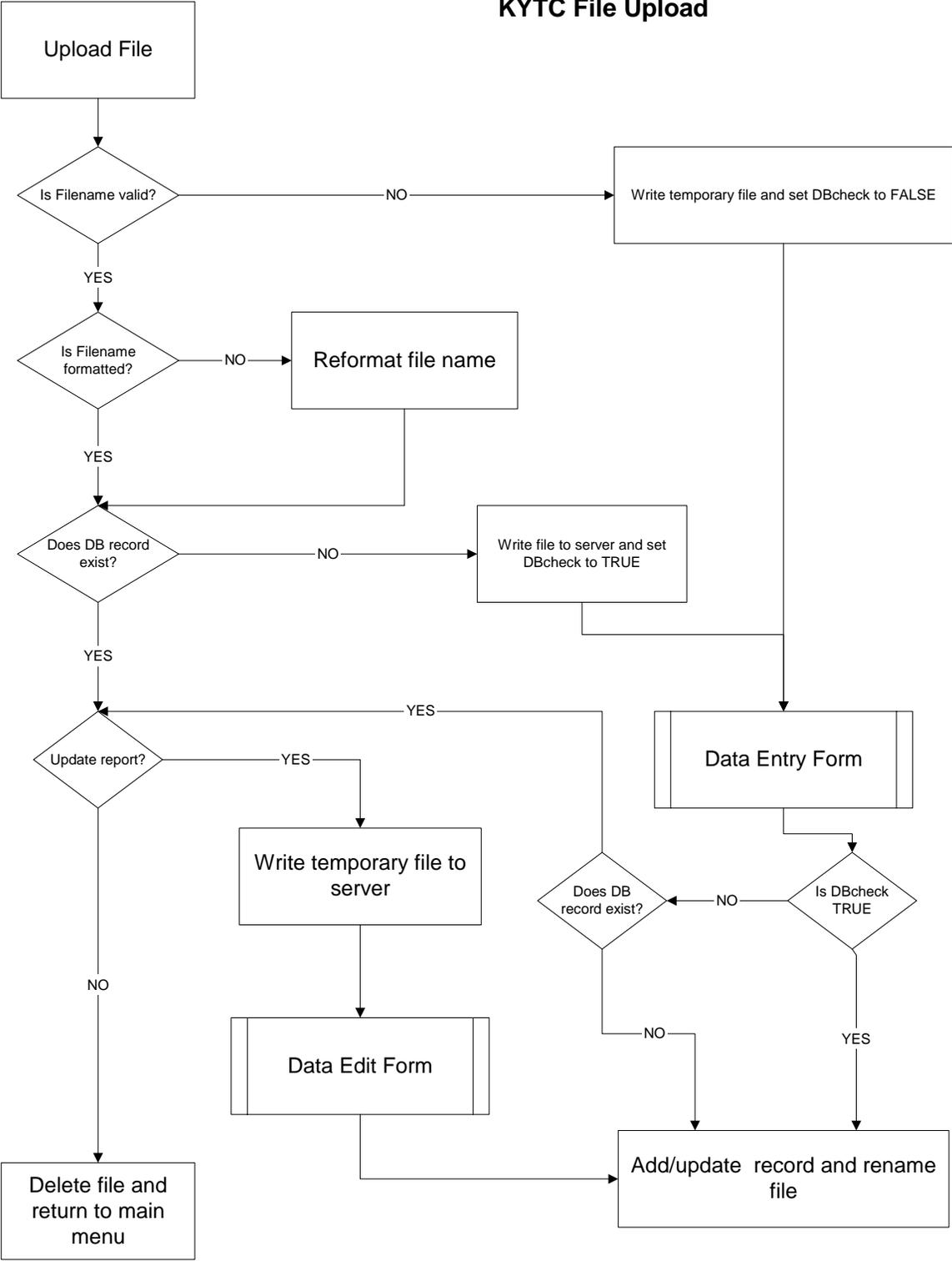
[Back to Search Page](#)

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 Last modified May 26, 2006 .

Figure 20. Search results page.

APPENDIX I
File Upload Logic

KYTC File Upload



Flow chart for file upload decision tree.

APPENDIX II
Database Dictionary
KYTC Reports

Name	Type	Size	Comments
kytc_id	Long Integer	4	Unique Key
company_name	Text	50	
county_number	Text	3	Format 95
county_name	Text	12	Proper Case
item_number	Text	15	Format 09-0001.01
district	Text	2	Format 07
item	Text	7	Item number prefix. Format 0001.01
parent_project	Text	10	Report name for encompassing project
project_type	Text	15	
report_type	Text	10	
project_phase	Text	15	
mars_number	Text	8	Format 6664701D
mars_project	Text	5	Format 666647
report_name	Text	10	Format S-001-1995
report_number	Text	3	Format 001
report_year	Text	4	Format 1995
route_label	Text	15	Format US-25W
road_name	Text	100	
bridge_number	Text	12	Format 00605
bridge_identifier	Text	20	Format 59-RR-00606
bridge_prefix	Text	3	Format RR
bridge_suffix	Text	1	P
structure_over	Text	250	
documents_only	Integer	2	Yes/No
addendum	Integer	2	Number of modifications
begin_mp	Text	10	Format 12.3
end_mp	Text	10	Format 12.4
county_pulldown	Text	30	Used to construct edit form
project_type_input	Text	30	Used to construct edit form
mars_suffix	Text	3	Format 01D
route_pulldown	Text	30	Format KY
route_number	Text	4	Format 65
route_suffix	Text	2	Format X
route_suffix2	Text	10	
route_section	Text	3	
city	Text	30	Identifier for reports with no exact location
quad	Text	30	Identifier for reports with no exact location
maparea	Text	30	FK to Mapareas extent database
pages	Text	5	Format 6
str_codes	Memo	-	Geologic unit names
rock_fall_fence	Integer	2	Contents y/n
wire_mesh	Integer	2	Contents y/n
back_stowing	Integer	2	Contents y/n
shape_ditches	Integer	2	Contents y/n
dynamic_compaction	Integer	2	Contents y/n
wick_drains	Integer	2	Contents y/n
surcharging	Integer	2	Contents y/n
gabian_baskets	Integer	2	Contents y/n
rss_slopes	Integer	2	Contents y/n
tunnels	Integer	2	Contents y/n
tied_back_walls	Integer	2	Contents y/n

soil_nail_walls	Integer	2	Contents y/n
drilled_shafts	Integer	2	Contents y/n
mining	Integer	2	Contents y/n
geophysics	Integer	2	Contents y/n
instrumentation	Integer	2	Contents y/n
seismic_design	Integer	2	Contents y/n
litigations	Integer	2	Contents y/n
black_shale	Integer	2	Contents y/n
lightweight_fill	Integer	2	Contents y/n
shotcrete	Integer	2	Contents y/n
project_layout	Integer	2	Contents y/n
location_map	Integer	2	Contents y/n
subsurface_data_sheet	Integer	2	Contents y/n
soil_profile	Integer	2	Contents y/n
geotech_notes	Integer	2	Contents y/n
cut_stability	Integer	2	Contents y/n
embankment_stability	Integer	2	Contents y/n
loading_diagrams	Integer	2	Contents y/n
coordinate_data_sheet	Integer	2	Contents y/n
excess_materials	Integer	2	Contents y/n
chemical_stabilization	Integer	2	Contents y/n
sinkholes	Integer	2	Contents y/n
settlement_platform	Integer	2	Contents y/n
cantilever_wall	Integer	2	Contents y/n
cantilever_hpile_wall	Integer	2	Contents y/n
cantilever_rsteel_wall	Integer	2	Contents y/n
mse_wall	Integer	2	Contents y/n
rock_bolts	Integer	2	Contents y/n
friction_piles	Integer	2	Contents y/n
end_bearing_piles	Integer	2	Contents y/n
entry_person	Text	30	Data entry person
entry_date	Date/Time	8	Data entry data
edit_person	Text	30	Last edit person
edit_date	Date/Time	8	Last edit date
other_contents	Memo	-	Non standard contents
description	Memo	-	Brief project description
PublicationId	Integer	2	FK to Publications database

Implementation Plan

Project Name: Making Geotechnical Reports available on the Web		KGS Account Number: 3046963900		
Principal Investigator: Gerald Weisenfluh		KyTC Project Number: SPR 314-06		
SAC Chair: Bill Broyles		Date: July 26, 2006		
Objectives: Develop Web-based data entry tools to permit Geotechnical Branch staff to catalog yearly reports, and make them available on the Internet in electronic format. Develop Web search form for finding reports according to location and contents.				
Recommendations: Utilize data entry tools to construct electronic catalog of geotechnical reports. Migrate information and documents into ProjectWise system for internal Cabinet access.				
Action Steps	Responsible Party	Start Date	Finish Date	Budget
Develop database and data entry tools	Weisenfluh	7/1/2005	9/30/2005	
Catalog Structure reports	Broyles/Hager	10/1/2005	6/1/2006	
Catalog Roadway and other reports	Broyles/Hager	6/1/2006	12/31/2006	
Migrate reports to ProjectWise	Holmes	1/1/2007	12/31/2007	

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